

THE CHANGING MARKET STRUCTURE OF THE FARM
EQUIPMENT MANUFACTURERS AND DEALERSHIPS

by

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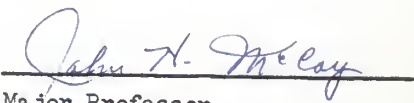
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I. INTRODUCTION

Objective and Scope

In the December, 1963 issue of the Journal of Farm Economics, Robert L. Clodius stated, "In the contrast between farm firms and nonfarm firms it should be apparent that the farmer has little market power. This is true at the local market level where the farmer sells his livestock, grain and milk and buys his feed, fertilizer and farm machinery."¹ With the mechanization of farms, the relative importance of farm equipment in the farm organization has increased. The value of farm machinery shipments increased from \$112 million in 1904 to \$364 million in 1959 and to \$2,842 million in 1963.² The increasing importance of farm equipment as an input for the farm sector points towards changes in the market power interrelationships between the farm equipment manufacturers, dealers and the farm operator. The number of dealers between 1940 and 1958 decreased from 27,500 to 18,000,³ and the number of full-line manufacturers dropped from nine in 1940 to seven in 1966. The fluctuation in numbers indicates that major changes have taken place in the environment which surrounds firms in the industry.

The objectives of this report are (1) to identify the changes that have occurred in the variables of market structure as they are related to the farm

¹Robert L. Clodius, "Lessons for Farm Economist from Recent Antitrust Decisions - An Economist's View." Journal of Farm Economics 44 (December, 1962), 1904.

²U. S. Dept. of Commerce, Census of Manufacturers, 1914, 1940, 1963, (Washington, U. S. Government Printing Office).

³W. G. Phillips, "The Changing Structure of Markets for Farm Machinery" Journal of Farm Economics 40 (December, 1958), p. 1173.

equipment manufacturers and dealerships and (2) to show possible implications as to future changes as a result of trends established by the analysis of past changes. Inferences on market performance and market conduct will be made where possible.

Theoretical Bases for the Analysis

A basic economic postulate fundamental to market structure analysis is that the structural or environmental nature of an industry influences market conduct which is in turn related to market performance of that industry. Economic theory supporting the postulate is founded in two areas, Marshallian price theory and institutional economics. Marshallian economics emphasized two polar cases for the analysis of market performance: perfect competition and monopoly. Elaborate economic models explaining the relative performance of these two illustrative cases of market structure are available in the literature. As formal theorists became increasingly aware of the wide variations to be found in the real world in the conduct of firms and in the performance of industries, modifications were made in the assumptions regarding number and size of firms, product and mobility. Fellner's⁴ treatment of number and sizes, Chamberlin's⁵ consideration of product characteristics, and Bain's⁶ study of entry were significant contributions in the variables associated with market structure. Institutional economists using their own techniques of economic analysis have concentrated on studying the institutional aspects of organization

⁴W. J. Fellner, Competition Among the Few: Oligopoly and Similar Market Structures. 1ed. (New York: A. A. Knoph, 1949.)

⁵E. H. Chamberlin, Theory of Monopolistic Competition, 2ed. (Cambridge: Harvard University Press, 1936)

⁶J. S. Bain, Barriers to New Competition (Cambridge: Harvard University Press, 1956).

and performances of industrial and labor markets. They have pointed out certain imperfections of markets. Thus from these two divergent schools of economics has developed the vast area of economics studies related to the performance of markets as influenced by the market structure of the industry.

Throughout this discussion "industry" and "market" will be used and the definition of both is important. Because Professor Bain's definitions are generally accepted, they will be used. "An industry is strictly a group of sellers of close-substitute outputs who supply a common group of buyers."⁷ "A market is conveniently defined as a closely interrelated group of sellers and buyers. Therefore we may define a market as including all the sellers in any individual industry, and all the buyers to whom they sell."⁸ The strict application of these definitions to empirical research is impractical, if not impossible, without some application of a prior knowledge. But, they do serve as specific concepts that are applied to the report. The deliniation of these terms relative to the farm equipment industry will be discussed later.

What is market structure analysis? Walsh and Evans define it negatively. "Market structure analysis is less concerned with the private interest in the maximization of individual bakery firm profits, levels than with the public interest in greater per capita production, more optimum distribution of resources, freedom of opportunity and the like."⁹ Market structure analysis is synonymous with market organization. The study of market organization is encompassed in three areas those of market structure, market conduct, and market performance.

⁷Joe Bain, Industrial Organization, (New York: John Wiley and Sons, Inc., 1959), p. 6.

⁸Ibid. 7.

⁹Richard G. Walsh and Bert M. Evans, Economics of Change in Market Structure, Conduct and Performance - The Baking Industry 1947-1958. University of Nebraska, N.S. No. 28 (Lincoln, Nebraska, December, 1963), p. 3.

"Market structure refers here to the organizational characteristics of a market; and for practical purposes we emphasize those characteristics which determine the relations of sellers in the market to each other, of buyers in the market to each other, of sellers to the buyers, and of sellers established in the market to other actual or potential suppliers of goods, including potential new firms which might enter the market. In other words, market structure for practical purposes means those characteristics of the organization of a market which seem to influence strategically the nature of competition and prices within the market."¹⁰ From various patterns of market structure we can infer certain market performance characteristics.

Whereas market structure is concerned with the environment of the industry, market conduct centers on the pattern of behavior which enterprises follow in adopting or adjusting to the market in which they sell or buy.¹¹ It encompasses the patterns of behavior displayed by firms in their policies related to the product market and to rival firms in the market. The manner in which firms adjust reflects in the efficiency of their operation. The flow of influence between market structure and market conduct is towards the latter. The environment of the industry affects the individual firm to some extent, but the degree to which structure influences conduct is difficult to determine.

Richard Caves defines "market performance as the appraisal of how much the economic results of an industry's market behavior deviate from the best possible contribution it could make to achieving these goals."¹² Economists are concerned with finding gaps between actual performance and potential

¹⁰ Joe Bain, Industrial Organization, p. 7.

¹¹ Ibid., 9.

¹² Richard Caves, American Industry: Structure, Conduct, Performance. (Englewood Cliffs, New Jersey: Prentice Hall Inc., 1964), p. 95.

performance of individual industries. They are interested in identifying the features of market structure and market conduct that result in deviations from the potential. For example, established firms tend to side step new innovations and new comers use new innovations as a means to enter the market. Thus, high barriers to entry tend to discourage innovations.

In studying the market structure of an industry Bain emphasized these four organizational characteristics of a market:

1. The degree of seller concentration - described by the number and the size distribution of sellers in the market.
2. The degree of buyer concentration - defined in parallel fashion.
3. The degree of product differentiation as among the outputs (though similar) are viewed as nonidentical by buyers.
4. The condition of entry to the market - referring to the relative ease or difficulty with which new sellers may enter the market, have over other potential entrants.¹³

Economic theory provides a set of market categories such as monopoly, perfect competition, monopolistic competition and oligopoly. The first two categories account for the polar positions of market organization, and monopolistic competition describes the industries with many sellers having a differentiated product. Oligopoly, defined as a few sellers occupying the market, is used to explain the gamut of possibilities between many and two.

The concept of concentration ratios has been devised as a structural measure of the intermediate combinations. These ratios account for both number and size distribution of firms. They are computed simply by arranging firms in order of size (e.g. employees or sales), calculating the percentage share each has of the industry and adding the percentages of the top x firms. The usual breaking points are the largest four, largest eight, and largest twenty firms in the industry.

¹³Ibid., 8.

Realizing the arbitrary nature of any grouping, Richard Caves groups manufacturing industries as follows:

Type I oligopolies - the largest eight firms make at least 50 per cent of the industries' shipments; the largest twenty make at least 75 percent.

Type II oligopolies - the largest eight firms make at least 33 per cent of the shipments; the largest twenty make less than 75 per cent.

Unconcentrated industries - the largest eight firms make less than 33 per cent of the shipments.¹⁴

This grouping will serve as a measure of the relative concentration of sellers and buyers in the farm equipment industry. The degree of concentration of buyers and sellers have a significant influence on the character, intensity and effectiveness of competition among buyers and sellers and the character of the relationship between buyers and sellers.

The third characteristic, the degree of product differentiation, refers to or measures the extent to which buyers differentiate, distinguish, or have specific preferences among the competing output of the various sellers established in an industry. For example, how much substitutibility is there between the tractors of the seven full-line farm equipment manufacturers. As such, the degree of product differentiation is an important influence of the character of the competitive relationships of the established member sellers of the industry.

Cross-elasticity of demand between various pairs of output is the ideal measure of the degree of product differentiation. The cross-elasticity of demand between pairs of output will be perceptible and finite, but not infinite, if buyers' preferences do exist.

¹⁴Caves, 11.

J. S. Bain discusses three primary sources of product differentiation:

- (1) the differences in quality or design among competing outputs.
- (2) the ignorance of buyers regarding the essential characteristics.
- (3) the persuasive sales-promotion activities of sellers, and particularly by advertising.¹⁵

The last characteristic of market structure to be considered is the condition of entry. The condition of entry to an industry essentially refers to the degree of the advantages which sellers already established in an industry have over potential new entrant sellers.¹⁶ It thus determines the competitive relationship between established and potential entrant sellers, and the effectiveness of the threat of new competitors as a force governing the policies of established sellers.

"The condition of entry may be measured on a numerical scale by defining the advantage of established over-potential entrant sellers in a certain systematic way, namely, as the largest percentage by which established sellers can persistently elevate their prices above the minimized or competitive average costs or production and distribution without inducing new sellers to enter the industry."¹⁷ The scope of this report is limited and this type of measurement will not be attempted.

Bain identifies the following sources of barriers to entry:

- (1) Product barriers
 - (a) accumulated preferences of buyers
 - (b) exclusive control of superior product design
 - (c) the ownership or control of favored system of distribution

¹⁵Bain, Industrial Organization, pp. 214-215.

¹⁶Ibid., 210

¹⁷Ibid., 237.

- (2) Absolute superiority
 - (a) control over superior production techniques
 - (b) exclusive ownership by established firms of superior deposits of resources required
 - (c) inability of entrant firms to acquire necessary factors of production
 - (d) less favored access of entrant firms to liquid funds for investments.
- (3) Economy of scale barriers.¹⁸

The four characteristics of market structure, so far discussed, the degree of buyers and seller concentration, the barriers to entry and the degree of product differentiation are only the primary characteristics. Others are market demand, ratio of fixed to variable costs, geographical structure of the market, and the degree of durability. These last characteristics will be applied to the analysis where they are a major factor of change in the market structure of the farm equipment industry.

Sources and Method

Census data does not cover separately the farm implement and machinery business of the large concerns which the trade classifies as farm implement manufacturers. The Bureau of the Census defines the farm machinery and equipment industry as including "establishments that manufacture machinery for use in the preparation and maintenance of the soil; planting and harvesting of the crops; processing, on the farm, crops for market; or for use in performing other farm operations and processes."¹⁹ A more acceptable definition would be that the farm machinery and equipment industry includes those firms which

¹⁸Ibid., 240.

¹⁹U. S. Bureau of the Census, Census of Manufacturers, 1963. "Industrial Statistics: Engines and Turbines and Farm Machinery and Equipment MC 63 (2)-35A" (Washington D.C., U. S. Government Printing Office, 1961), p. 35.

manufacture machinery and tractors for use in preparing and maintaining the soil, in the planting, cultivating and harvesting of crops and in marketing farm crops. Since much of the published material is based on census data, this difference in definition must be considered when making comparisons.

The farm machinery industry has an international market; however, the domestic market is the primary outlet for production. In 1963, the total value of tractor shipments in the United States was \$1,631,875,000 and only \$60,159,000 or 3.2 per cent of this was for the export market.²⁰ Imports of farm machinery are small and will not be considered in the analysis. The study involves only the United States.

Farm machinery manufacturers are classified as full-line and short-line manufacturers. The full-line or long-line manufacturers are those engaged in the manufacture of farm tillage implements, seeding and planting implements, cultivators, harvesting machines, farm-hauling equipment and farm power - developing machinery.²¹ Short-line manufacturers are those who manufacture implements of one or more lines but not a complete assortment. These short-line producers generally operate in localized areas specializing in implements specific to that region.

The farm machinery industry began with the invention of the first successfully operated reaper by Cyrus Hall McCormick in Virginia in 1831.²² The major emphasis of this report begins in 1902 when the International Harvester Co. was consolidated out of the five largest harvesting companies and controlled

²⁰U. S. Department of Commerce, Statistical Abstract of the United States 1965, 86th ed. (Washington, U. S. Government Printing Office, 1965), p. 819.

²¹Another definition is those manufacturers who market a complete line of machines and power units.

²²William G. Phillips, The Agricultural Implement Industry in Canada, (Toronto, Canada,; University of Toronto Press, 1956), p. 3.

90 percent of the trade in grain binders and 80 per cent in mowers for the United States.²³ This incorporation marked the beginning of the large full-line manufacturer.

The life span of the industry has been broken into four stages of development: (1) pre-1920, (2) 1920-1939, (3) 1940-1959, and (4) current market conditions. The pre-1920 era covers the span of time during which the industry was born and grew into large companies manufacturing full-lines. The 1920-1940 period featured displacement of horses by the wheel-tractor and innovations such as the rubber tire and power take-off system, both of which expanded the use of the tractor. With the beginning of World War II, the industry experienced a rapid expansion of its retail organization which was followed in the 1950's by an adjustment to a slackening demand and also the rapid acceptance by farmers of new technology and larger units. The last stage is the current period. Once again the demand for farm equipment has become strong, and the demand for larger units exceeds that of the 1950's. The main source of material for this analysis has been published reports. Some unpublished materials were obtained from masters' thesis and doctoral dissertations and comments by George H. Seferowich, the editor of a trade magazine, Farm Implement and Tractor. Among the foremost writers on structural aspects of the industry are W. G. Phillips, Michael Conant, W. A. Cromarty. The U. S. Federal Trade Commission made inquiries into the industry in 1913, 1920, 1939 and 1948, providing valuable historical data. Also, the Federal Trade Commission repeatedly covers the industry in its studies of concentration in the manufacturing industries. The Bureau of the Census, through its publication, Census of Manufacturers reports data on the industry. But this does not give a complete picture because

²³Ibid., 14.

of the definition used. For example, a dealer is defined as an establishment selling primarily farm machinery and mixture of equipment. Some dealers also handle automobiles and hardware, the difference between the types of merchandise can cause a dealer to be reclassified although his business did not change.

The method of analysis has been to review available information on each of the four market structure variables discussed above in each stage of the development of the industry. Where information was not available, implied relationships were used. From stage to stage, trends of changes are inferred where possible to help in clarifying implications concerning future changes.

II. PRE - 1920 ERA OF MERGERS

The farm equipment industry's first boom came during and following the Civil War. Farm labor was in short supply and farmers were willing to accept the new harvesting machines. Throughout the war period, crops were generally abundant and the demand for agricultural produce was high. From the end of the Civil War to 1880, expansion westward continued the strong demand for the new implements.

Market stabilization followed in the 1890's when the number of manufacturers declined (Table 1) and competition among the remaining firms became reckless. W. G. Phillips describes the situation:

Such were the conditions in the American implement industry which paved the way for the harvester war of the 1890's and for the wave of concentration that followed. During the nineties, selling competition among harvesting machinery producers was carried to what now appears ridiculous extremes. Flamboyant advertising, extravagant field contests, and unbelievably easy terms all seem to have been the order of the day.¹

This competitive phase was followed by mergers between the rival companies. In 1902, the International Harvester Company was organized by the consolidation of the five largest producers of harvesting machinery. They were the McCormick Harvesting Machinery Company, the Deering Harvester Company, the Plano Manufacturing, the Warder, Bushell and Glessner Company, and the Milwaukee Harvester Company.² Later in the period the practice was to merge with or to purchase outright companies producing complementary lines of farm implements. International Harvester purchased firms making tillage equipment, and Deere and Company expanded in seeding and harvesting lines.

¹Ibid., 12.

²Ibid., 14.

Shortly after 1915, the full-line firm had emerged as the major form of organization in the agricultural implements industry. The era of mergers came to a close with the ending of World War I and a court consent decree in 1918 against International Harvester Company.

Seller Concentration

During this early stage of development, the trend in the number of establishments was first an increase and then a decline (Table I). Between 1859 and 1919 the number of establishments declined from 2,116 to 521. The sharpest drop came between 1879 and 1889 when the number dropped from 1,943 to 910, a 53 per cent decline.

TABLE I

GROWTH OF THE MANUFACTURE OF AGRICULTURAL IMPLEMENTS
ACCORDING TO THE CENSUS REPORTS, 1849 - 1914

YEAR	NUMBER OF ESTABLISHMENTS	CAPITAL INVESTED	TOTAL VALUE OF PRODUCT
1849	1,333	\$ 3,564,202	\$ 6,842,611
1859	2,116	13,866,389	20,831,904
1869	2,076	34,834,600	52,066,875
1879	1,943	62,109,668	68,640,486
1889	910	145,313,997	81,271,651
1899	715	157,707,951	101,207,428
1904	648	196,740,700	112,007,344
1909	640	256,281,000	146,329,268
1914	601	338,531,673	164,086,835
1919	521	366,962,052	304,961,256

SOURCE: U. S. Federal Trade Commission. Report on the Causes of High Prices of Farm Implements. (Washington, D. C.: U. S. Government Printing Office, May 4, 1920), p. 43.

The factors causing this trend were fighting the Civil War, settling of the western states, and improving transportation. The Civil War and the accompanying good crop years caused a shortage of farm labor. The new harvesting machines provided the farmer with a low cost substitute; consequently, the demand for the machines was good. Holders of patents on the harvester machines, such as McCormick, sold rights to other producers for the right to manufacture his machine. This practice resulted in a large number of establishments. Selling rights were feasible because of the transportation problem. Following the Civil War, transportation improved, but the grain producing area was expanding westward, a fact which led to firms opening shops nearer the new producing areas, thus accounting for the slower rate of decline in establishments between 1859 and 1879.

During the 1890's, the market stabilized. This affected competition in the implement industry in three ways: (1) it decreased the importance of spatial competition, (2) it brought about the disappearance of many small firms which had previously produced on contract with larger holders of key patents, and (3) it induced manufacturers to take a long critical look at their distributive organization.³

At the beginning of the twentieth century, the transportation system had developed to such an extent that centralized production employing large plants was profitable. In 1902, the era of mergers began with the forming of the International Harvester Company. This combination brought under single control 90 per cent of the trade in grain binders and 80 per cent of the trade in mowers for the United States. The company in the year following acquired three more important producers of harvesting machinery to increase their share of the

³Ibid., 12.

market: D. M. Osborne and Company, Aultmen-Miller Company, and Minnie Harvester Company.⁴

Publicly the reason given for the mergers was that the competition during the harvester war was adverse to the public interest. However, the Bureau of Corporations 1912 report on International Harvester observed that although competition in the pre-amalgamation period had been keen it had not been as ruinous as the companies had claimed.⁵

In 1911, Deere and Company became the second largest equipment producer in the U. S. Its growth came by acquisition, consolidation, and the expansion of its own plants. Again the competitive nature of the industry was restricted by reducing the number of establishments.

What about the size distribution? Referring to Table I, one can see that the trend in size of establishments was toward larger units. In 1859, the investment per company was just over \$6,500 and by 1914, this had jumped to over \$563,000 per establishment, of course the value of the dollar also changed. The trend towards larger units follows from the trend of centralized production established by the larger amalgamated companies.

At the founding, International Harvester Company had essentially a monopolistic position with 85 per cent of the total output in the harvesting machinery business. The Bureau of Corporations noted in 1914 that the "monopolistic" position of the International Harvester Company in harvesting machines was maintained, while it controlled a considerable and increasing percentage of the business in new lines.⁶

⁴Ibid., 14

⁵Department of Commerce and Labor, Bureau of Corporation. The International Harvester Company. (Washington: U.S. Government Printing Office, 1913) p. 66.

⁶Ibid.

The single most important external factor affecting the competitive nature of the industry started in 1914 as a result of the report by the Bureau of Corporations. The International Harvester Company was charged with violation of the Sherman Anti-Trust Act and in August of 1914, was ordered separated and divided among at least three substantially equal, separate, distinct, and independent corporations with wholly separate owners and stockholders. The company argued its case in court until 1918, when a joint consent decree which modified the original decree was handed down. This action discouraged further attempts to corner the market. In summary, seller concentration by the end of 1919 was highly concentrated and the industry would be classified as a type I oligopoly using Richard Caves' classification.

Buyer Concentration

The primary means of distribution in the farm equipment industry since its beginning has been through an independent dealer organization. In the 1800's the machinery was manufactured close to the agricultural producing areas where only a small marketing organization was required. During the harvester war of the 1890's, the dealer organization was developed to the point where there were four or more per town; a competitive relationship developed as a result. Also, to offer a complete line of machines to the farmer, the dealer handled products from several manufacturers, a process which complicated the dealer's business still more.

With the forming of the International Harvester Company and the subsequent full-line manufacturers, the dealers became more dependent on a single manufacturer. Manufacturers practiced full-line forcing where the dealers could sell only those products manufactured by the full-line manufacturer and this practice hindered the dealer in his selection of merchandise.

In fact after the amalgamation of the harvester companies, International Harvester Company maintained a dual system of dealers. Each system of dealers sold a different brand name: McCormick and Deering. This organization evolved because before the merger each of the harvesting companies had its own dealership organization and after consolidation Harvester wanted to get maximum penetration of the market.

The system of dual dealers was ended by a consent decree of the courts in 1918, enjoining the company from having more than one agent or representative in any city or town in the United States for the sale of its harvesting machinery or other implements. The immediate effect was a drastic reduction in the number of International Harvester dealers, from 21,800 in 1917 to 13,860 in 1919.⁷

The competition between dealers was intense. Some manufacturers and wholesalers of farm machinery did not sell solely through dealers; these firms could sell at a lower cost. This practice was the chief cause for the organization of dealers' associations. One of the first was the Kansas dealers association, founded in 1889.⁸ Farm machinery dealers association sought from the beginning to discourage the practice of price cutting. In some instances, certain small associations attempted to fix the prices at which their members should sell. Later, the principal associations gave considerable attention to the possibility of securing greater harmony among competing dealers by organizing local clubs. These organizations apparently had little success in fixing prices.⁹

⁷Phillips, The Agricultural Implement Industry in Canada, p. 18

⁸U. S. Department of Commerce Bureau of Corporations, Farm Machinery Trade Associations. (Washington D.C.: U.S. Government Printing Office, 1915) p. 9.

⁹Ibid., 11.

The size distribution of the dealer organization is not available. However, the volume of business per dealer must have been increasing with the number of dealers decreasing as noted by the Harvester example and the value of shipments by the industry increasing from six million in 1849 to 304 million in 1919 or over 5000 per cent increasing in sales.

TABLE 2

AGRICULTURAL IMPLEMENTS (including tractors) -- NUMBER OF
ESTABLISHMENTS AND VALUE OF PRODUCTS BIENNIAL -- 1921 to 1939

CENSUS YEAR	NUMBER OF ESTABLISHMENTS	VALUE OF PRODUCTS (\$1,000)
1921	353	\$163,817
1923	312	151,286
1925	303	169,468
1927	277	202,732
1929	293	277,854
1931	250	168,318
1933	194	64,951
1935	241	291,254
1937	298	587,341
1939	347	421,847

SOURCE: U. S. Bureau of Census, Statistical Abstract of the United States 1932, 1940, and 1942. (Washington: U. S. Government Printing Office), 1932, p. 752; 1940, p. 831; and 1942, p. 913.

The trade area of the dealership was the approximate size of a county or smaller. Thus the relative size between the manufacturer and its franchised dealers had gone in favor of the manufacturer in this pre-World War I development stage. This resulted in the dealer being weak in price dealings with the manufacturer. But the dealer could switch to another manufacturer as an alternative.

What is the relative relationship between the farmer and the dealer? Here again for this era data is not available. The Bureau of the Census published the number of farms for the year 1900, 1910, and 1920 but no data on farm machinery dealers. Comparison of the number of manufacturers with the number of farmers is not possible because the Census of Manufacture is available only for the years cited in Table I.

Product Differentiation

The early farm machines were differentiated mainly by quality, and the importance early manufacturers placed on patent rights points this out. Phillips noted, "Patent disputes began early. In 1850 McCormick brought suit against Seymour and Morgan, one of the earliest producers of the McCormick machine on contract, and was awarded victory in 1854 hundreds of suits and counter-suits marked the era."¹⁰

Attempts to install buyer preference were tried early. Phillips cites an example of rivalry between McCormick and Hussey, the first successful reapers.

Up and down the seaboard states the two reapers were matched repeatedly in field trials and public exhibits. Both inventors bombarded the press with claims of superiority for their own machines and with belittling comments about the rival. The campaign doubtless provided good advertising for the rivals, and for the idea of mechanical graincutting but its results were highly inconclusive as far as the respective merits of the two machines were concerned.¹¹

During this early period real and false product differences existed.

¹⁰Phillips, The Agricultural Implement Industry in Canada, p. 5.

¹¹Ibid., 4.

The importance of product differentiation in the incorporation phase is illustrated by the practice followed by the International Harvester Company. After 1912, when the McCormick and Deering lines had become established as the leading sellers, the company was still marketing harvesting machinery under the names of McCormick, Deering, Champion, Buckeye, Milwaukee, and Osborne. It hesitated to abandon the trade names formerly used by its constituents for fear of losing buyers who through habit or conviction had become attached to one of them.¹²

Barriers to Entry

New firms entering the farm equipment industry encountered disadvantages in four areas: (1) established preferences of buyers, (2) determination of prices, (3) cost of production, and (4) distribution of products. New firms did experience favorable conditions when new products using new technology was their motive for entering the market. Henry Ford introduced the Fordson tractor in 1917 and won wide acceptance with his low priced (\$885) small tractor.¹³ This was Henry Ford's first attempt at large scale production of farm equipment.

Established preferences tend to limit the size of the market for new sellers. The buying pattern played an important part in International Harvester's decision to continue merchandising under six brand names after its founding in 1902. Conant observed,

¹²Ibid., 18.

¹³Ibid., p. 27.

When, through large selling expenses consumer's preferences for the products of one or a few long-line firms are established, overcoming these preferences may be one formidable barrier to the entry of new firms into the field. This can be illustrated by the detailed selling expense for 1918.¹⁴

Conant also pointed out the fact that larger producers determine general prices for the industry. A smaller firm wishing to set a price different from the general one must consider his ability to differentiate his product and the reactions of the larger firms to his price move.¹⁵

Economies of scale were enjoyed by the large full-line manufacturers in production and distribution. The Federal Trade Commission's 1920 Report on the Causes of High Prices of Farm Equipment Implements showed in a comparison of the total cost of the McCormick harvesting machines with the harvesting machines of five other manufacturers that the McCormick line had the lowest cost. A five-foot mower, in 1916, in the McCormick line cost \$27.72 and the next company's cost was \$31.24 for a difference of \$3.52. The difference in manufacturing costs on a corn binder was \$16.77 in 1916 and \$40.76 in 1918.¹⁶ This advantage explains part of the dominant position that International Harvester had in the manufacturing of harvesting machinery.

The established distribution system for farm implements was through company-owned branch wholesale operations for the full-line firms and through independent wholesalers for the smaller manufacturers. The independent dealer then purchased from the manufacturers or independent wholesalers or both. The

¹⁴Michael Conant. "Aspects of Monopoly and Price Policies in the Farm Machinery Industry Since 1902." (Unpublished Ph.D. Dissertation, University of Chicago, 1949), p. 33.

¹⁵Ibid., 92.

¹⁶U. S. Federal Trade Commission, Report on the Causes of High Prices of Farm Implements, p. 669.

full-line manufacturers carried on a policy to get the best dealers in each community, which meant the short-line manufacturers and new firms had to use less desirable outlets or dealers. The farmer having an established purchasing pattern of buying from the dealer organization was not always willing to try new sources of supply.

In summary, the pre-World War I era saw in the farm machinery industry the birth of a new industry which in rapid fashion took on monopolistic characteristics in the International Harvester Company. The court order in 1914 did much to cut monopoly profits enjoyed by this firm, but the firm continued to dominate sales and maintain lower costs of production. Harvester was losing its share of the market in 1919, but remained the leader. The Federal Trade Commission went on record to state that the court dissolution was not sufficient and wanted still stronger measures to bring about a condition of competition in the harvesting machine lines.¹⁷

The market power was shifting toward the manufacturer. The dealer was increasing his influence on the farmer, and the manufacturer was gaining a greater degree of control over the dealers.

¹⁷Ibid., p. 680

III. 1920 TO 1939 THE TRACTOR REVOLUTION

During the inter-war years, the industry experienced the rapid acceptance by farmers of new technological developments and the competition between firms for the acceptance of new products caused several alterations in the market structure of the industry. The International Harvester Company lost part of its share of the market, new full-line manufacturers entered the market, and a new merchandising technique was tried. Also, the industry's profits followed farm income, an event which resulted in the entering and exiting for firms.

Seller Concentration

The degree of seller concentration underwent changes as indicated by the number of manufacturers producing the share of the market held by full-line producers. The number of establishments generally declined until after 1933, when only 194 establishments produced farm implements. After this depression year, the number of manufacturers increased until in 1939 there were 347 establishments, just six less than in 1921. The entry and exit of firms tended to follow the business cycle. In 1929, when general business conditions were good the number of establishments increased. But, the number dropped in 1931 to below the 1927 density (Table 2). Short-line manufacturers accounted for the increase in establishments after 1933.

Full-line manufacturers increased their share of the total farm machinery sales during this period, but there were more full-line manufacturers to split the market. Michael Conant's study estimated these portions, but they are subject to a considerable margin of error because domestic sales data are not normally published by firms. However, the market share of the full-line producers did increase between 1922 and 1937. Michael Conant listed four full-

line firms in 1922, and seven in 1937. This misrepresents the importance of large manufacturers because Ford Motor Company had 80 per cent of the tractor sales in 1922 and is not included as a full-line firm because Ford did not produce a full-line of implements. Ford discontinued tractor production in the United States in 1928.¹ The Federal Trade Commission's 1938 report listed eight full-line manufacturers, which included the original seven plus B. F. Avery and Sons Company.²

Market shares of the full-line manufacturers were unstable. Allis Chalmers was seventh in the industry in 1929 and grew to third by 1939. International Harvester was continuing to lose its market position. These changes in portion of sales reflects the firm's ability or inability to compete in new technological developments and improvements. Although Harvester dominated the harvesting lines, the company was losing its market position because these machines were not the principal product of the industry. Allis Chalmers grew because of its new products: the WC tractors and the "all crop" combines. These products found wide acceptance because they were smaller units which the small farmers could use more effectively and profitably.

¹Phillips, The Agricultural Implement Industry in Canada, p. 25.

²Federal Trade Commission. Report on the Agricultural Implement and Machinery Industry. (Washington, D.C.: U.S. Government Printing Office, 1938)p.11.

TABLE 3

ESTIMATED SHARE IN DOMESTIC FARM
MACHINERY SALES BY FULL-LINE PRODUCERS

FIRM	1922	1929	1937	1948
Total, full-line firms	64.6	54.7	42.6	73.7
International Harvester	44.0	28.3	32.7	22.8
Deere and Co.	11.6	11.9	18.5	15.3
J. I. Case	9.0	3.8	4.8	7.0
Allis Chalmers Mfg. Co.		1.8	8.1	6.9
Oliver Corp.		4.7	4.8	4.2
Minneapolis-Moline Co.		2.5	2.7	3.6
Massey-Harris Co.		1.7	1.0	3.8
Dearborn Motor Corp.				10.2

SOURCE: Michael Conant, "Competition in the Farm Machinery Industry", Journal of Business of the University of Chicago, (January, 1953), p. 27.

Another example of the part new technology played in market structure changes was the Fordson tractor. Henry Ford produced the first Fordson in 1917 and by 1923 had sold 80 per cent of the tractors in the United States. He did not modify the original model to any great extent, nor did he manufacture a matching line of implements. In 1925, the Fordson reached its peak sales and then declined until production was stopped in 1928. Conant concludes that the Fordson failed because Ford refused to recognize that constant innovation was the key to success.³

³Conant, 61.

The Federal Trade Commission's 1938 report noted:

"The fact that, for many important farm implements and machines, not to exceed four to six large long-line manufacturers produce and sell from 80 to 100 per cent of the total sold in the United States, in itself constitutes a situation under which the competitive acts of individual large companies may have highly restrictive effects upon the business of smaller manufacturers and tend to weaken competition among the large companies."⁴

For example, in 1936 five full-line companies manufactured 95.8 per cent of the grain and rice binders produced in the United States. Four full-line companies manufactured 100 per cent of the horse or tractor-drawn corn binders.⁵

This highly concentrated industry did not have interlocking directorates. Of the 183 companies reviewed in the Federal Trade Commission's 1938 report, only one instance was recorded in which the same individual was a director in two companies, owning 50 shares in one company and one share in the other.⁶

The short-line manufacturers maintained their important position in the industry. The late 1920's saw several full-line companies organized by combining small manufacturers: Allis Chalmers Manufacturing Company and Oliver Farm Equipment Company. The increase in the number of establishments in 1937 shown in Table 2 represents more short-line manufacturers.

The size of these short-line companies varied. The Federal Trade Commission's 1938 report covered 138 companies, only twelve of which had investments of between one and three million dollars. Small manufacturers were able to maintain their competitive positions because of their low overhead and their flexibility in meeting new technology. Also, their transportation costs were

⁴Federal Trade Commission Report, 1938, p. 20.

⁵Ibid., 147

⁶Ibid., 16.

lower than those of the full-line manufacturers because they shipped short distances to serve their local market whereas the larger firms manufacture their products primarily in the Western Great Lakes area.

Mail-order houses expanded into the farm equipment industry during this era. These firms attempted to sell machinery and repair parts through catalogs, but soon found selling to farmers via this medium was difficult because farmers wanted to see and handle the item before making a purchase. Also, mail-order houses could not provide service to farmers. Montgomery-Ward and Sears-Roebuck and Company were the largest of these firms, and they essentially discontinued efforts to sell implements by the late 1930's. Farm supplies and some repair parts were maintained by the mail-order houses but as an important factor in the industry the mail-order house was out by 1935.⁷

Buyer Concentration

Farm equipment dealers in number followed the trend in farm implement sales. In 1929 when sales were up, so was the dealer population; in 1935, when sales hit a low for the depression years, dealer numbers also decreased. This trend is reflected in Table 4 below. This table on the number of dealers and the sales volume includes implement and hardware dealers. But there is no evidence to support the idea that the mix of the two types changed greatly during the period which would distort the data. Census data is available for only the years listed.

⁷Ibid., 139.

The number of farms declined from 6,448,343 in 1920 to 6,096,799 in 1940. During the depression years, the number of farms increased but their number did not reach the 1920 level.⁸ The size distribution shifted towards larger units. In 1920, 23.1 per cent of the land was in farms with 1,000 acres or more; in 1940, there was 34.3 per cent in this category.⁹

TABLE 4
FARM IMPLEMENT, TRACTOR, AND HARDWARE DEALERS
IN THE UNITED STATES -- NUMBER OF STORES AND SALES

YEAR	NUMBER OF DEALERS	SALES (\$1,000)
1929	12,242	\$518,507
1935	9,637	291,762
1939	10,499	344,433

SOURCE: U.S. Bureau of Census, Statistical Abstract of the United States 1942, Washington, D.C.: U.S. Government Printing Office, 1943), p. 966.

During the 1920 to 1940 period the trend in market power relationships within the industry was mixed. The full-line manufacturers as a group increased their share of the market sales volume, but the number of full-line manufacturers doubled from four to eight. The short-line manufacturers experienced a growth in their number in the late 1930's, but the percentage of the sales volume accounted for by this group declined. The mail-order house came and went. The dealers were still subject to the manufacturers' price policy, and their number changed with the trend of farm equipment sales.

⁸Statistical Abstracts of the United States 1942, p. 674.

⁹Ibid.

Product Differentiation

Product differentiation continued as an important dimension of the market structure of the farm equipment industry. The primary emphasis was on customer service, brand names, and quality. The lack of customer service was a major factor in the failure of mail order houses to become established in the industry. They depend on the lower price made possible by the elimination of personal salesmen, trade-ins, credit extensions and follow-up services to sell these products. They did use some retail outlets, but had to increase prices above the catalog prices in these stores. The farmer's dependence on the services which the mail-order houses left out was sufficient to force these firms out of the market. The price of the machine that a farmer purchased included the services related to product. The farmer must have then expected to pay for these services if he wanted them.

Brand names were evident in the industry. In a study designed to investigate the distribution methods for twenty-one manufacturers of agricultural implements, the advertising cost per one hundred dollars cost of implements was \$1.31.¹⁰ This practice tends to establish customer preference, and the manufacturers can differentiate prices and compete in nonprice factors. However, price competition was important during this era, as demonstrated by the Fordson Tractor manufactured by the Ford Motor Company and by the Allis Chalmers Manufacturing Company's "all-crop" combine.

Major changes in the quality of products caused much of the instability in market shares. For example Allis-Chalmers in 1929 had 1.8 per cent of domestic sales and by 1937 their share was 8.1 per cent. During this time, two

¹⁰U. S. Federal Trade Commission, Report on Distribution Methods and Costs (Washington, D. C.: U.S. Government Printing Office, March 2, 1944), p. 176.

innovations to old product lines were introduced by the company: the 5-foot "all-crop" combine and the rubber tired tractor. This quality aspect of the products forces companies to introduce new and improved products periodically and results in increased cost associated with the production changes. This practice of periodic changes results in higher prices being paid by the farmer, but this has resulted in more efficient machines. The all-purpose tractor of International Harvester Company in 1924 was an example of more efficient machines being introduced.¹¹

Barriers to Entry

Entry of new firms into the industry had two aspects during this era. One was the process of short-line producers becoming a full-line producer and the second was ability of short-line manufacturers to enter the market. Firms were able to enter industry at both the above levels. During 1928 and 1929 four new full-line manufacturers were organized by the mergers or acquisition of short-line manufacturers: the Allis Chalmers Manufacturing Company, the Oliver Farm Equipment Company, the B. F. Avery and Sons Company and the Massey-Harris Manufacturing Company. The marked increase in farm implement manufacturing establishments from 1935 to 1937 was entirely new short-line manufacturers.

The competition between the short-line and long-line manufacturers for dealers was the main obstacle in the growth path of small manufacturers. The full-line companies were more attractive to independent dealers because the larger companies furnished the dealers with an almost complete line of machinery and a tractor. A dealer needed a tractor to sell in order to generate

¹¹Phillips, The Agricultural Implement Industry in Canada, p. 33

sufficient volume to warrant his staying in operation. Also, a major portion of farm equipment sales were credit sales, first to the dealer and then to the farmer. This requirement for capital could not be overcome by many short-line firms, and dealers often would not sell the smaller company's products for this reason.

The relative cost of production between the long and short-line companies varied. The distribution costs of short-line companies were lower, but they used wholesalers and jobbers because the narrow selection of products did not offer sufficient volume to warrant a sales force.

Mail-order houses tried to circumvent the established distribution channels and were not successful. These firms originally distributed farm implements and parts through separate farm implement catalogs. Later these catalogs were supplemental with retail outlets. However, with the increased use of mechanized farm equipment, involving heavier, and more complex implements and machines, the role of the mail-order houses as distributors was limited. In 1939, a few were still operating but these had specialized in one or a few items. The mail-order houses' main disadvantages were the lack of service facilities, the necessity of shipping farm implements in a knocked-down form, the lack of display, and the lack of easy credit terms.¹²

OTHER STRUCTURAL ELEMENTS

Price leadership was the accepted pricing policy of farm equipment industry. International Harvester Company and Deere and Company were the pace setters in the industry in the establishment of prices and in the granting of

¹²Federal Trade Commission Report, 1938, p. 139.

terms of sales to dealers. This price leadership policy was facilitated and made possible by extensive exchanges of prices among individual manufacturers. "It was claimed, however, that most exchanges are not made until prices have been definitely decided upon and published to the trade."¹³

With the mechanization of farms the capital structure of the farm equipment industry changes. The investment per company increased and the return on investment declined. The 1939 Federal Trade Commission Report showed that for the manufacturers reporting the average return on investment was 11.39 per cent for the years 1913 to 1918 inclusive. Then from 1929 to 1936 the average return on investment was 7.98 per cent.¹⁴ Part of the difference between the two periods was due to the general economic conditions of agriculture, but most of the difference was caused by the changes in the market structure of the industry.

¹³Ibid., 21.

¹⁴Ibid., 394.

IV. 1940 - 1959

During the twenty-year span between 1940 and 1959, the market for farm equipment went through three phases and in each phase changes occurred in the market structure of the industry. During World War II, the first phase, the production of farm machinery was curtailed sharply by government controls on the use of steel. The industry experienced a "seller's market" after the war when the industry over-expanded. In 1953, the "seller's market" ended and the sale of farm equipment stabilized.

In 1942, farm machinery prices were frozen along with prices of other commodities, remaining unchanged until 1946. The rationing of steel during this period favored the small manufacturers of farm equipment. These firms often received the same volume of steel during the war years as they had used in prior years. This steel allowed them to maintain their market share and their number increased. In 1939, there were 317 establishments manufacturing farm machinery; in 1947, this number had increased to 1,102.¹ These figures included full-line manufacturers, but it is evident most of the increase was in short-line firms.

In 1946, the price freeze was lifted and the rush was on. Farmers had experienced profitable years during and following the war. Machines were wearing out from continuous use and new machines were in limited supply. Contrary to expected price rises, on March 8, 1947, International Harvester Company announced price reductions on about one half of its machines.² Other firms followed the price cut and Michael Conant noted the reason why the member firms

¹Statistical Abstract of the United States, 1952, p. 829.

²Conant, p. 74.

followed price reductions. "The high cross elasticity of demand between Harvester products and those of other firms plus the possibility of renewed pairing of buyers and sellers after the machinery backlog was filled made rival firms hesitate in raising prices even though capacity output could have been sold at higher prices."³

During this phase, a system of allocating production to dealers was developed by full-line manufacturers. This system hastened complaints from dealers because the manufacturers could not fill the allocations. Labor strikes at the plants and steel shortages slowed the flow of machinery and as a result, many dealers suffered extreme financial embarrassment.

In the spring of 1953, the seller's market ended with inventories present on dealer's lots for the first time since the early 1940's. Farmers were faced with reduced prices causing the demand for new machines to slackened. This stabilizing of the market caused many dealers to go out of business and the full-line manufacturers to tighten their belts.

Seller Concentration

Major changes in seller concentration occurred in two areas of importance. The full-line manufacturers increased their market share as a group, but another full-line firm developed and most of the old-line firms underwent major revisions. The second element of change was an increase in the number of companies in the industry.

The precise change in full-line manufacturers' market shares is not available. Michael Conant illustrated the change between 1937 and 1948, (Table 3).

³Ibid., 75.

The percentage of the value of shipments by the industry accounted for by the full-line manufacturers increased from 72.6 per cent in 1937 to 73.7 per cent in 1948. International Harvester Company's share of the shipments declined from 32.7 per cent in 1937 to 22.8 in 1948. Dearborn Motor Corporation entered the market and accounted for 10.2 per cent of the total shipment. Four of the smaller full-line firms increased their position, whereas International Harvester Company and Deere and Company, the industry's leaders, both declined. This shift shows that although there was a definite trend towards increasing the concentration in the full-line manufacturers, the concentration within any one company was declining during the first part of this period.

Concentration continued high during the 1950's with Deere and Company passing International Harvester Company to become the leader in dollar volume in the United States. But, the degree of concentration is best discussed by dividing the industry into product groups (Table 5).

In 1958, the eight largest companies accounted for only 58 per cent of the total shipments of farm machinery and equipment. But, when considering product groups the eight largest companies in the industry had increased their control. The eight largest manufacturers of wheel tractors and parts controlled 96 per cent of market. This industry was very highly concentrated.

TABLE 5

PER CENT OF VALUE OF SHIPMENTS OF FARM MACHINERY AND
EQUIPMENT AND SELECTED PRODUCT GROUPS ACCOUNTED
FOR BY THE LARGEST COMPANIES

PRODUCT GROUPS	PER CENT OF VALUE OF SHIPMENTS ACCOUNTED FOR BY			
	4 Largest Companies	8 Largest Companies	20 Largest Companies	50 Largest Companies
Farm Machinery and Equipment	44	58	68	77
Wheel Tractor and Parts	72	96	99	99+
Planting, Seeding & Fertilizing Mach.	63	76	89	97
Harvesting Machinery	70	81	92	98
Haying Machinery	72	84	97	99

SOURCE: U. S. Bureau of the Census Report for the Subcommittee of Anti-trust and Monopoly of the Committee on the Judiciary United States Senate, Concentration Ratios in Manufacturing Industry 1958. (Washington, D. C.; U. S. Government Printing Office, 1962), Part I pp. 148-149.

At the end of the 1930's, the number of establishments manufacturing farm machinery and equipment increased, and this trend continued into the post-war period. The important change here is that these new establishments were short-line manufacturers (Table 6). Because the 1958 Census of Manufacturers redefined the classification of farm machinery and equipment industry, earlier data are not comparable. But for 1958, over one fourth of the establishments employed less than five employees. "Establishments" and "companies" are not interchangeable terms for reporting census data; however, the difference between the two classification terms does not distract from the fact that small short-line manufacturers accounted for the increase.

TABLE 6
FARM MACHINERY AND EQUIPMENT ESTABLISHMENTS
BY EMPLOYMENT SIZE: 1958 AND 1963

ITEM	1958	1963	Percentage Change
Companies Total	1,389	1,481	+ 6.6
Establishments Total	1,469	1,568	+ 6.7
1 to 4 employees	485	526	+ 8.5
5 to 9 employees	258	237	- 7.4
10 to 19 employees	217	247	+13.8
20 to 49 employees	241	264	+ 8.3
50 to 99 employees	110	143	+30.0
100 to 249 employees	91	80	-12.1
250 to 499 employees	24	30	+25.0
500 to 999 employees	21	21	-----
1,000 to 2,499 employees	14	12	-14.3
2,500 employees and over	8	8	-----

SOURCE: U. S. Bureau of Census: Census of Manufacturers 1958, 1963, (Washington, D. C.: U. S. Government Printing Office), pp. 35A-9 and 35A-11.

Buyer Concentration

Following World War II, the number of farm equipment dealers increased. A survey of dealers in Louisiana found that about 40 per cent of the firms that were in business in 1960 started between 1940 and 1949.⁴ The United States Census of Business shows the largest number of dealers for 1958 with 19,008 (Table 7). However, there is evidence that this data does not represent the

⁴Floyd L. Corty and Richard G. Morrison, "The Retail Farm Equipment Business in Louisiana" Bulletin No. 558. Louisiana State University Agricultural Experiment Station, (Baton Rouge, Louisiana Agricultural Experiment Station, October, 1962), p. 33.

true trend in the number of dealers. First, the Bureau of the Census defines farm equipment dealers as "Establishments primarily selling farm tractors, repairs, mowers, plows, wagons, and related farm equipment."⁵ The "primary" aspect of this definition accounts for some of the increase in 1958. Because of the trend towards larger farm equipment dealers, a few dealers were reclassified from categories such as hardware stores and new car dealers. Second, a study by C. J. Fliginger of farm equipment retailing in South Dakota found that 10 per cent of the sample dealers suspended operations during 1955.⁶ The decrease in the number of farm equipment dealers probably started soon after 1953 when the post-war sales boom ended, but no facts are available to support this conclusion.

Interesting also is the manufacturer with the greatest number of dealers. Fliginger's study noted that the manufacturer having the largest number of retail outlets in South Dakota was International Harvester Company, followed by Deere and Company and J. I. Case Manufacturing Company.⁷

⁵U. S. Bureau of the Census, Census of Business 1958. (Washington: U. S. Government Printing Office, 1961), p. APP-3.

⁶C. John Fliginger, "Farm Equipment Retailing in South Dakota", Agricultural Economics Pamphlet No. 74, South Dakota State College (College Station, S. D.: South Dakota State College, July, 1956), p. 7.

⁷Ibid., 8.

TABLE 7
FARM EQUIPMENT DEALERS: NUMBER AND SALES
1948, 1954, 1958 AND 1963

YEAR	NUMBER OF ESTABLISHMENTS	SALES (\$1,000)
1963	16,362	3,626,072
1958	19,008	3,185,715
1954	18,689	2,804,532
1948	17,509	2,385,963

SOURCE: U. S. Bureau of the Census. Census of Business 1948, 1954, 1958, and 1963. (Washington, D. C.: U. S. Government Printing Office), p. 1-7.

The size of each retail establishment grew during the 1950's. The study by Corty and Morrison found that between 1950 and 1959 about two-thirds of the dealers had enlarged the size of their establishments, added new lines of merchandise, or increased the number of employees.⁸ The average investment of the 214 retail farm equipment firms studied in Louisiana was \$121,500.⁹

Fliginger in South Dakota noted that in one area of the state over 75 per cent of the dealers had gross sales over \$100,000 and in another 69.7 per cent of the firms had sales greater than \$250,000 and only 2.1 per cent had gross sales greater than \$500,000.¹⁰

The trade area served by a retail dealer varied between sectors of the United States and areas within a state. In South Dakota, the more heavily populated the areas the smaller the dealers' size and trade area tended to be.

⁸Corty and Morrison, 18.

⁹Ibid., 28.

¹⁰Fliginger, 8.

The average radius of the trade area in that state was 32.5 miles.¹¹ In Louisiana, the average trade area had a radius of 23 miles.¹² The geographical characteristics account for the difference in trade area radii for the two states.

The competitive relationships between the dealer and the manufacturer is almost nonexistent. The contracts between dealers and manufacturer restricts the dealer to price bargaining to within the dealer's normal volume discounts.¹³ However, in some instances dealers have dropped the franchise of one manufacturer and signed with another manufacturer.

Dealers contended in South Dakota that their own line dealers were the toughest to compete with. Their reasoning was that "when the farmer decided to purchase, he first decided what line of machinery he wanted. Then, he went to different dealers of that line and compared prices, putting dealers against dealers against dealer on trade-in allowances and price."¹⁴ Thus, the dealer is placed in a cost price squeeze in which the manufacturers established the cost of machines and competition with member dealers for the farmer's machinery dollar resulted in lower selling prices for the dealer.

Product Differentiation

Rapid technological obsolescence of machines over shadowed attempts at product differentiation. Tractors built in 1950 did not provide that same productive service as those built in 1959. The company that provided the new

¹¹Ibid.

¹²Corty and Morrison, p. 10.

¹³Fliginger, p. 13.

¹⁴Ibid., 20.

units with more power and versatility quickly replaced the old established company. For example, Deere and Company displaced International Harvester Company as number one in domestic sales in the late 1950's.

Standardization of products was one of the leading functions of trade associations in the industry. The marketing of many sizes and styles of a given machine was considered by the full-line firms to add more to costs than to revenues. The standardization policies seemed to have little effect on the marketing of farm machinery because the large dollar volume machinery items such as tractors and combines are subject to rapidly changing technology.¹⁵

The service provided at the dealer's door was the primary factor that differentiated the product of one manufacturer from that of another. The vast increase in the mechanization of farms caused the farmer to depend on repairs and services supplied by the dealer. When a combine breaks down during the harvesting season, the farm operator wants repairs quickly and will patronize the dealer that can supply the needed parts. With the system of franchised dealers, the farmer tends to purchase the machines sold by the dealer who provides the best service.

An example of the importance of the dealer's service to the farmer and manufacturer occurred in 1958 when Ford Motor Company introduced its Model 6000, the largest domestic tractor at that time. The company merchandised the tractor aggressively and sold several units. But, when Model 6000 went into continuous use, "it just went to pieces, to such an extent that the company finally came out with a policy whereby a reengineered and redesigned tractor of like power was given to each customer who owned the tractor with the product difficulty, and the unsatisfactory tractor was taken back either into the distributor's place

¹⁵Conant, Journal of Business, p. 29.

of business or the dealer's place of business and repaired in accord with a program laid down by the Ford Motor Company, and then we offered them to our customers as rebuilt tractors."¹⁶ Without a system containing a dealer service organization this operation would have cost the company considerably to ship the units back to the factory. The farmer would have lost the use of a tractor had not the dealer been able to service it for him while Ford Motor Company developed their policy on replacement and rebuilding.

Cromarty noted that "Manufacturers cannot afford to not stock parts since farmers' decisions to buy machinery are in part determined by the willingness of manufacturers to supply repair parts in subsequent years."¹⁷

A new dimension of dealer service that recieved considerable attention was renting or leasing of farm equipment by the dealer to local farmers. The proclaimed advantages of the practice are as follows:¹⁸

- (1) the machinery dealer can put his new and used equipment to work when sales are low,
- (2) the dealers are making available to farmers machines that the farmers could not generally afford to use,
- (3) the farmer can free his capital to expand his operation elsewhere,
- (4) the farmer can make his operation more responsive to productive requirements.

Opponents of the rental practice contend that the capital requirements for a dealer make the practice unfeasible. The typical equipment dealer has neither sufficient capital nor the required number of machines to stock a

¹⁶U. S. Senate, Subcommittee of the Select Committee on Small Business, Ford Tractor Distributors 88 Congress, 2nd Session, February 10, 1964, (Washington, D. C.: U. S. Government Printing Office, 1964), p. 153.

¹⁷Cromarty, 34.

¹⁸"Bouquest and Brickbats Greet the Farm Machine Rental Plan," Co-op Grain Quarterly 16 (May, 1958), p. 66.

wide selection. Also, the service charge sufficient to be profitable to the dealer would cost the farmer more than the conventional means.¹⁹

The rental or leasing program was in limited use. Corty and Morrison's 1960 study of Louisiana dealers found that 10 per cent of the equipment dealers were leasing out equipment for demonstration or to meet a farming emergency.²⁰ The future use of rental machines by farmers will be limited. However, as tractors and machines become more expensive, leasing arrangements between manufacturers or some leasing company will become popular. The extent of the development of this practice as a dimension of the dealer's operation will become more important.

Barriers to Entry

Earlier in this chapter it has been noted that the number of short-line manufacturers had increased markedly between 1940 and 1959. What conditions were present that permitted this expansion? There are two primary reasons why these small firms increased in number: an expanding market and their competitive positions. The sellers' market after World War II and the ability of small manufacturers to get steel during the war to meet this market was favorable to them.

These short-line manufacturers enjoyed a limited competitive advantage, producing speciality items within a limited market. The volume was not sufficient for the full-line manufacturers to supply. The difference in farming practices between agricultural producing areas increased the need for these special localized machines.

¹⁹Ibid., 68.

²⁰Corty and Morrison, p. 33.

Also, the small manufacturer had cost advantages over local areas as a study in Texas showed that the freight on implements exceeds the freight on steel into that area.²¹ Because the major centers of production for agricultural machinery are in the Western Great Lakes States this difference in freight rates encouraged the local producers. These small family firms had lower overhead and used cheaper labor, which, when combined with the other cost advantages, gave the small manufacturer a competitive advantage over a limited market for special products.

However, expansion by these firms beyond certain effective barriers will bring complications of a physical, economic, and social nature. As they approach the existing implement producing centers, competition with them becomes greater. As shipments leave the area of origin, rail traffic changes, transit time increases, and interline shipments become more common. Also, there is a tendency in the farm machinery market for farmers to favor local manufacturers; and as a manufacturer extends his territory, the less loyalty he will find towards his product.

For potential full-line manufacturers, the conditions of entry remained almost the same as during the 1920's and 1930's when full-line firms developed during boom periods. During the sellers' market, Ford Motor Company expanded its operations in farm equipment and the Cockshutt Farm Equipment of Canada, Limited expanded its operations into the United States. After the backlog of demand for new machines was filled in 1953, these full-line companies experienced some hard times. Net income as per cent of net assets for the industry declined from 15.6 per cent in 1950 to a low of 5.9 per cent in 1957.²² The effect of

²¹ John W. Tippit, "Texas Potentialities in Agricultural Implement Production." Research Report 41, (College Station, Texas: Texas Engineering Experiment Station, February, 1953), p. 9.

²² Slater, p. 1252.

reduced profits became apparent in the 1960's when White Motor Company acquired three firms: Oliver Farm Equipment Corporation, Minneapolis-Moline Inc. and Cockshutt Farm Equipment of Canada Limited.

Over a period of time, the net profit of the industry was not shared equally by all companies. The three largest firms had the highest net profits. These profits did not mean that these firms were the most efficient. Two of these firms were the oldest long-line firms in the industry and have established consumer preference for their products over the years. Conant infers that the whole market structure of the industry might be the cause of the superiority of the largest firms.²³ Their distribution system affords them their competitive advantage. Some new arrangement of the market structure that is more effective may prove beneficial for potential new firms and could possibly lower the cost of farm equipment.

Although treated so far in this report as a buyer, the farm equipment dealer is an essential part of the distribution system. Two studies conducted during the late 1950's pointed out some of the barriers potential new dealers have to surmount. Important barriers are minimum capital, volume or sales, location of business, and obtaining a franchise. Fliginger estimated that the break-even point in 1955 was a gross sales of approximately \$175,000.²⁴ Corty and Morrison's analysis noted that in the areas encompassing dealers having high gross income, the number of farms per dealer averaged from 232 to 382.²⁵

Capital requirements to start in business depended on the size and type of market. Needed capital varied from \$25,000 to \$100,000 or more, exclusive

²³Conant Ph.D. Dissertation, p. 5.

²⁴Fliginger, p. 11

²⁵Corty and Morrison, p. 9

of land and building. Companies discouraged applicants when severe under-capitalization is evident.²⁶

Prospective dealers inquiring about a franchise are considered only on the fact that they are qualified in all respects to purchase, sell, service and finance the company's products on a continuing basis. The potential new dealer must sign a Dealer's Sales Agreement with the full-line company he is to do business with. The full-line manufacturers are continually searching out young potential dealers to develop their dealer organization. Thus, the prospective dealer who is qualified would have little trouble acquiring a franchise.

The location of the firm is important. It must be near the normal trade center of sufficient size to draw a number of farmers to the dealer. Also, the new dealer must be familiar with the area. A man qualified to be a dealer in South Dakota would have a hard go in Louisiana.

²⁶Ibid., 25.

V. CURRENT MARKET PERIOD

Seller Concentration

The take-over by White Motor Company of three full-line producers of farm machinery resulted in the industry becoming more concentrated. In 1960 and 1961, White Motor Company got control of Oliver Farm Equipment Company, Minneapolis-Moline Incorporated and Cochshutt Farm Equipment of Canada Limited. White Motor operated these firms as separate entities. Within the United States, Oliver and Minneapolis-Moline each maintained their separate marketing system of branch houses, brand names, and dealers. In production, however, a plant will often manufacture the same machine for both brand names, only difference being the color of paint applied.

Annual farm equipment sales volume of the seven companies is not published and intra-industry knowledge of member firm's sales is limited. In discussions with representatives from two of the full-line firms, they stated that they had only rough estimates of their rival firm's sales. The information that these representatives had was obtained mostly from annual reports to stockholders and they did not consider their figure correct. Forbes¹ published rough estimates of the sales volume of the respective companies, but stressed that these figures were very rough estimates (Table 8).

The large increase in sales between the 1959 and 1961 average and the 1965 figures illustrates the rise in farm equipment sales. How this increased dollar volume has been distributed among all companies has not been determined. The data of Forbes shows the firms primarily manufacturing farm equipment as having grown the most.

¹"Deere and Co." Forbes (June 15, 1966), p. 36.

TABLE 8

ESTIMATED FARM EQUIPMENT FOR SEVEN
FULL-LINE MANUFACTURERS OF FARM EQUIPMENT*

Company	Farm Equipment **		Per Cent Increase
	1959-61 Avg. Millions	1965 Annual Millions	
<u>Primarily Farm Equipment</u>			
Case, J. I.	\$125	\$235	88%
Deere & Co.	457	830	82
***Massey-Ferguson	395	710	80
<u>Diversified</u>			
Allis-Chalmers	140	215	54
Ford Motor	380	525	38
Intn'l Harvester	601	862	44
White Motor	---	210	--

SOURCE: "Deere and Co." FORBES June, 15, 1966, p. 36.

* The farm equipment sales figures are very rough. Some companies, such as Ford Motor, does not break out farm machinery sales at all, other companies mix in industrial and other equipment. Thus, FORBES figures show International Harvester slightly ahead of Deere in farm equipment sales but Deere claims that it is ahead when industrial sales are excluded.

**Estimated; excludes industrial equipment and diesel engines except for International Harvester and Ford.

***Massey-Ferguson sales are in Canadian dollars.

Bureau of the Census data in Table 6, indicated an increase in the number of small establishments. The largest increase, 30.0 per cent, came in establishments with an employment of between fifty and ninety-nine. Additional information on these small firms is not available. The growth patterns, entry and exit rates, competitive nature and products produced are needed to analyze the concentration among them and the full-line firms.

Buyer Concentration

Dealers are decreasing in number as shown in Table 7. This is further substantiated by a study of dealerships numbers in Kansas. For Kansas, a complete list of the farm equipment dealers is given in the Trade Directory of the Western Retail Implements and Hardware Association for 1956 and 1963. The first directory published in 1956 listed 1076 and in 1963 the number had dropped to 738.² These totals include both the farm implement dealers and combination dealers, those having franchised dealerships in farm equipment and in addition handle a general line of hardware or farm supplies.

The distribution across the state of this declining dealer population is fairly even with the South Central region and the northern row of counties showing a slightly greater loss than the other regions. Sedgwick county with eighteen had the most dealers of any county. Wichita is located in that county, a fact which would support Fliginger's finding in South Dakota that in the more heavily populated areas the size and trade area of dealers tend to be smaller.³

Not only are there fewer dealerships, but also fewer towns per county have dealerships. Out of 104 counties in Kansas, only 4 showed an increase in towns with dealers while 49 decreased.⁴ This decline was relatively even across the state with the Central Region showing a slightly greater decline. Also, the number of dealerships per town decreased with an average number of dealerships per town in 1956 of 3.1 and in 1963 of 2.6.

²Western Retail Implement and Hardware Association, Western's Trade Directory 1956 and 1963. (Kansas City, Missouri, 1956, 1963).

³Fliginger, p. 8.

⁴Western Retail Implement and Hardware Association.

The industry in recent years has recognized the need for information on its dealer organization. As a result, the National Farm and Power Equipment Dealers Association organized a dealer population study and the Farm Equipment Institute agreed to pool figures on their sales to dealers. None of this data could be obtained for this report, but in the near future researchers will be able to obtain access to this information.

The size distribution of dealers in Kansas is not available, however, Corty and Morrison's study in Louisiana for 1960 does include an array of volume of business for dealers. The category with the most firms was those firms with a dollar volume of between \$100,000 to \$199,999 which accounted for 32.1 per cent of all firms. The volume of business ranged from \$8,000 to slightly more than \$1 million, with an average of \$286,000 per firm (Table 9).

TABLE 9

VOLUME OF BUSINESS, LOUISIANA
RETAIL FARM EQUIPMENT FIRMS, 1960

DOLLAR VOLUME OF BUSINESS	NUMBER OF FIRMS	PER CENT OF FIRMS
up to 49,000	7	5
50,000 to 99,000	23	17
100,000 to 199,999	41	32
200,000 to 299,999	24	18
300,000 to 399,999	13	9
400,000 to 499,999	11	8
500,000 to 899,999	14	10
<u>over 900,000</u>	<u>2</u>	<u>1</u>
Total	135	100

SOURCE: Floyd L. Corty and Richard G. Morrison "The Retail Farm Equipment Business in Louisiana," Bulletin No. 558 (Baton Rouge, Louisiana: Louisiana State University Agricultural Experiment Station, October, 1962), p.13.

As the ultimate purchaser of farm equipment, the farmer bargains with the dealer on price and service. With the number of farms decreasing and the size of farms increasing, the competitive relationship between the dealer and the farmer became keen. The farmer's ability to bargain was illustrated in Fliginger's report when dealers expressed their feelings that the farmer put dealer against dealer.⁵

Also, the ratio of farms per dealer has declined. In 1958, there were 19,008⁶ dealers and 4,233,000⁷ farms, for a farms per dealer ratio of 222.7. In 1963, the dealers numbered 16,362⁸ and farms numbered 3,374,000⁹, for a ratio of 200.1. As the number of farms per dealer decline, each farmer becomes more important to the dealer. Consider also, 10.3 per cent of the farmers accounted for 51.9 per cent of the 1960 agricultural sales.¹⁰ These 10.3 per cent or 333,000 farms spread equally among the 16,322 dealers in 1963 leaves only approximately 20 large farms per dealer. The fewer farms per dealer indicates that farmers have gained in bargaining power with the dealer.

⁵Fliginger, p. 20.

^{6,8}See Table 7.

^{7,9}U. S. Department of Agriculture, Economic Research Service FIS-203 "Farm Income Situation" (Washington, D. C.: U. S. Government Printing Office, July 1966), p. 41.

¹⁰Luther G. Tweeten, "The Income Structure of Farms by Economic Class," Journal of Farm Economics 47 (May, 1965) p. 208.

Barriers to Entry

Short-line manufacturers continued to crop up during the 1960 as shown by the 1963 Census of Manufacturers. The number of companies producing farm equipment jumped from 1,389 in 1958 to 1,481 in 1963 as illustrated in Table 6. This amounted to a new change of 92 companies for an average of 18.4 new companies per year. During this period the full-line companies dropped from nine to seven thus the increase in companies was entirely short-line manufacturers. Assuming these firms operated under some localized competitive nature, one can only suggest that some inefficiency of organization may exist. If this is so, future empirical investigation would be warranted.

The entry of new dealers is controlled by manufacturers. The relationship between the dealer and manufacturer is a formal contractual arrangement termed the Dealer's Sales Agreement or a Company Dealer Contract. The current practice of major companies has been to franchise dealers who do not sell another major brand of equipment. For example, Deere and Company will not grant a franchise to a dealer who also sells J. I. Case. Also, the manufacturers recognize that sales volume of a dealer must be large enough to support a strong dealer; therefore, the franchises are granted sparingly. There was not a set pattern for laying out trade areas, but the fact remains that there is some understanding and recognition of sales territories among dealers.¹¹

The number of dealers was controlled primarily by the full-line firms. Also, each of the full-line companies operated a few company retail stores which competed with independent dealers. The manufacturers had control over the location of new firms, but little control over the established firms.

¹¹Corty and Morrison, p. 25.

However, if the manufacturer thinks a certain trade area has a potential market for a dealer, they often cannot find a suitable dealer to serve the area.

Thus, the relationships between the dealer and manufacturer was on an individual basis with the manufacturer dominating because he controls the dealer's supply of new machines and repair parts. The dealer takes the price quoted by the manufacturer and the credit terms offered or the dealer's contract is cancelled by the manufacturer.

VI. PROJECTIONS AND IMPLICATIONS

Manufacturers, dealers, and farmers constitute the main elements of the farm equipment industry. Having so far discussed the trend of changes in the past, this report will now project these trends and infer how these changes will affect the manufacturers, dealers and farmers.

Reviewing the trends of changes in the market structure of the industry, four patterns have been established. These are that full-line companies as a group continually increased their dominance in market shares, that the short-line manufacturers have increased in number, that dealers have decreased in number, but increased in size, and that the number of ultimate buyers, farmers, has decreased rapidly.

Projecting these four trends, the future state of the industry becomes apparent. First, the full-line manufacturers will decrease in number, resulting in still higher concentration. Second, merchandising techniques of these firms will be altered, affecting the dealer organization. Third, the dealer can look forward to doing business with fewer farmers, but better customers. Fourth, dealers will increase their volume of business and trade area. Fifth, the farmer will require more service and make each purchase on a more business-like approach.

The number of full-line manufacturers has in the past stabilized or declined in periods of poor farm incomes. Farm incomes in recent years have risen, but not in a boom fashion. Thus, the profitability of farm equipment firms over the next five years will not be high. With profits low, a reasonable projection would be that one or more of the present seven full-line manufacturers will discontinue operation. The nature of this discontinuance may be by merger, consolidation or suspension of farm equipment operations.

Also important will be the future developments with the short-line manufacturers. These typically family firms will continue to be important, but they will be more centralized. Many of these will become dependent on wholesale distributors and may find it profitable to form an association with the wholesaler. Thus, the wholesaler will become more important in the distribution system.

As farm operations become larger and the knowledge of machinery requirement more perfected, manufacturers will adapt some of the technical merchandising techniques used in industrial goods markets. There are some who propose that the manufacturers establish company stores to sell all the machines and leave the dealership organization to provide the service. Another possibility is dealership chain operations where one dealer maintains two or more retail outlets under one contract.

Partly related to the more technical form of merchandizing is the inter-relationship between the dealer and the farmer. The number of farms per dealer will decline as was experienced in the early 1960's. The farmer will be a better customer because he will buy larger, more complex, and more expensive machines. To adopt these customers, the dealer must become a better businessman, doing a large volume over a wider area giving still more service.

The last trend, that of fewer farmers requiring more service and becoming more formal in their business dealings, is evident from census data. The number of farms declined by 859,000 between 1958 and 1963 and 10.3 per cent of these farms accounted for 51.9 per cent of the agricultural sales. As farms get larger and use more complex machines, the farmer will require more service.

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THE CHANGING MARKET STRUCTURE OF THE FARM
EQUIPMENT MANUFACTURERS AND DEALERSHIPS

by

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The purpose of this report is to present the results of a study of the market structure changes that have occurred in the farm machinery industry since its founding. Attention is also focused on the relationship of that industry to the farming sector of agriculture. The objectives of the study were (1) to identify the changes that had occurred in the characteristics of market structure as they are related to the farm equipment manufacturers and dealerships and (2) to show possible implications concerning future changes as a result of trends established by the analysis of past changes.

Market structure refers to the environmental characteristics of the market of an industry which influences strategically the nature of competition and prices within the market. The characteristics included in this report were seller and buyer concentration, product differentiation and barriers to entry. The method of analysis was to study these characteristics of market structure in four time periods, (1) pre-1920, (2) 1920 to 1939, (3) 1940 to 1959, and (4) the current market period, from which patterns of changes were established.

The four following patterns were established: (1) full-line companies as a group continually increased their dominance in market shares, (2) short-line manufacturers have increased in number, (3) dealers have decreased in number, but increased in size, and (4) the number of ultimate buyers, farmers, has decreased rapidly.

Projecting these four trends, the future state of the industry becomes apparent. First, the full-line manufacturers will decrease in number, resulting in still higher concentration in the industry. Second, the merchandising techniques of these firms will be altered and will affect the dealer organization. Third, the dealer can look forward to doing business with fewer farmers, but better customers. Fourth, dealers will increase their volume of

business and trade area. Fifth, the farmer will require more service and make each purchase on a more businesslike approach.

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As farms become larger and the machinery requirements more perfected, manufacturers will adapt some of the technical merchandising techniques used in industrial goods markets. Some already propose that the manufacturers establish company stores to sell all the machines and leave the dealership organization to provide the service. Also, a possibility is a dealership chain operation in which one dealer maintains two or more retail outlets under one dealership contract.

Partly related to the more technical form of merchandising is the inter-relationship between the dealer and the farmer. The number of farms per dealer will decline as it did in the early 1960's. The farmer will be a better customer because he will buy larger, more complex and more expensive machines.

To adapt to these customers, the dealer must become a better businessman, doing a larger volume over a wider area and giving still more service.

That there will be fewer farmers requiring more service and becoming more formal in their business dealings is evident from a review of census data. Between 1958 and 1963, the number of farms decreased by 859,000; 10.3 per cent of the farms accounted for 51.9 per cent of the agricultural sales during this period. As farms become larger and require more complex machinery, farmers will require more service.